TENDER

FOR

SUPPLY & INSTALLATION OF FULLY AUTOMATED LIQUID NITROGEN PLANT OF PRODUCTION CAPACITY ~20 LITER/HOUR,

IIT MANDI

Tender No.: IITMANDI/ADMIN/FPUR-135/2013-14/5766-67

Tender date: November 25th, 2013

Last Date of submission: December 16th, 2013

Indian Institute of Technology, Mandi

Administrative Block: Mandav Hotel, 2nd Floor (Above Bus Stand), Mandi – 175001 (H.P)

Tel.: 01905-300061 & 94184-25432 **email**: rik@iitmandi.ac.in & vkn@iitmandi.ac.in

Indian Institute of Technology Mandi, Mandi invites tender for supply, erection, installation, commissioning, testing, demonstration and training of **a fully automated liquid nitrogen plant (LN2 Plant)**, as per specifications given in the Annexures 1 attached to the Tender form. All offers should be made in English and should be written in both figures and words. Tender forms can be downloaded from the website (http://iitmandi.ac.in/administration/tenderseoi.html) of the Institute.

The bidders are requested to read the tender document carefully and ensure compliance with all specifications/instructions herein. Non-compliance with specifications/instructions in this document may disqualify the bidders from the tender exercise. The Director, IIT Mandi, reserves the right to select the item (in single or multiple units) or to reject any quotation wholly or partly without assigning any reason. Incomplete tenders, amendments and additions to tender after opening or late tenders are liable to be ignored and rejected.

Terms and Conditions:

1. The technical and financial bids should be quoted separately and put in different sealed envelopes marked "**Technical bid**" or "**Financial bid**" as applicable. These separate bids envelopes are to be put in an outer envelope which should also be sealed.

2. The Vendors who have earlier supplied the equipments to any of the IITs, IISc, IISERs and other Scientific Institute of National Repute may only tender. The details of such institutions and the cost with name of equipment may also be supplied with the bids.

3. The technical and financial bids should be submitted in original. The financial bid should include the cost of main equipment/item and its accessories. If there is any separate cost for installation etc. that should be quoted separately.

4. Each individual sealed envelope as well as the outer envelope should be marked with the following reference on the top left hand corner: "**IITMANDI/Admin/PUR-135 /2013-14/5766-67"**

5. The printed literature and catalogue/brochure giving full technical details should be included with the technical bid to verify the specifications quoted in the tender. The bidders should submit copies of suitable documents in support of their reputation, credentials and past performance.

6. The rates should be quoted in figures (typed or printed) and cutting should be avoided. The final amount should be in figures as well as in words. If there are cuttings, they should be duly initialed, failing which the bids are liable to be rejected.

7. Any bids received after **4:00 p.m. on 16th December, 2013** shall not be considered

8. The Technical Bids will be opened on **17th December, 2013 at 03:00 PM.** The date & time for opening of Financial Bids will be informed later.

9. While sending rates, the firm shall give an undertaking to the effect that "*the terms/conditions mentioned in the enquiry letter/Tender Notice against which the rates are being given are acceptable to the firm*." In case the firms do not give this undertaking, their rates will not be considered.

10. If the supplier/firm is original equipment manufacturer (OEM)/authorized dealer/sole distributor of any item, the certificate to this effect should be attached.

11. The quantity shown against the item is approximate and may vary as per demand of the Institute at the time of placing order.

12. All tender documents should have to be sent through courier, speed post or registered post only. All tender documents received after the specified date and time shall not be considered.

The postal address is:

"**AR Stores and Purchase"**
Indian Institute of Technology Mandi (IIT Mandi),
Administrative Block (Mandav Hotel,
Near Bus Stand), Mandi – 175001 (H.P), India"

13. In the event of any dispute or difference(s) between the vendee Institute (IIT Mandi) and the vendor(s) arising out of non-supply of material or supplies not found according to specifications or any other cause whatsoever relating to the supply or purchase order before or after the supply has been executed, shall be referred to "The Director, IIT Mandi", Mandi who may decide the matter himself or may appoint arbitrator(s) under the arbitration and conciliation Act1996. The decision of the arbitrator shall be final and binding on both the parties.

14. The place of arbitration and the language to be used in arbitral proceedings shall be decided by the arbitrator.

15. All disputes shall be subject to Mandi Jurisdiction only.

16. All tenders in which any of the prescribed conditions is not fulfilled or any condition is putforth by the tenderer shall be summarily rejected.

17. The bidders or their authorized representatives may also be present during the opening of the Technical Bid, if they desire so, at their own expenses.

Price bids of only those bidders will be opened whose technical bids are found suitable by the committee appointed for the purpose. Date and time of opening of price bids will be decided after technical bids have been evaluated by the committee. Information in this regard will be posted on Institute's web site / Notice board. In exceptional situation, an authorized committee may negotiate price with the qualified bidder quoting the lowest price before awarding the contract.

1. **Clarifications**:

In case the bidder requires any clarification regarding the tender documents, they are requested to contact our office (e-mail: rik@iitmandi.ac.in, vkn@iitmandi.ac.in & aks@iitmandi.ac.in on or **before 12/12/2013**.

2. **Tender Cost**:

A Demand draft of **Rs. 1,000/-(Rupees One Thousand only)** towards non-refundable **tender fee, for each item being quoted, drawn in favour of "The Registrar, IIT Mandi"** payable at Mandi should accompany the Technical bid documents. If the same firm is submitting bids for more than one instrument, they should submit the same in separate envelopes along with respective tender cost for each. In the absence of tender cost, the tender will not be accepted.

3. **Earnest Money Deposit (EMD)**:

If the cost of the equipments/items is more than Rs. 2 lakhs, a refundable amount @ 2% of the quoted price as earnest money deposit (EMD) in the shape of DD from Nationalized banks in India (valid for a minimum period of 3 months from the date of opening of tender) should be submitted. The DD should be drawn in favour of "The Registrar, IIT Mandi" payable at Mandi should accompany the bid documents. The EMD should be kept in a separate sealed envelope, should be marked clearly and put in the outer envelope that contains the technical and financial bid envelopes. The bidders should enclose a pre-receipted bill for the EMD to enable us to return the EMD of unsuccessful bidders. Failure to deposit **Earnest Money in each case** will lead to rejection of tender.

4. **Pre – Qualification Criteria**:

a. Bidders should be the manufacturer / authorized dealer. Letter of Authorization from original equipment manufacturer (OEM) on the same and specific to the tender should be enclosed.

b. An undertaking from the OEM is required stating that they would facilitate the bidder on a regular basis with technology/product updates and extend support for the warranty as well.

c. OEM should be internationally reputed Branded Company.

d. Non-compliance of tender terms, non-submission of required documents, lack of clarity of the specifications, contradiction between bidder specification and supporting documents etc. may lead to rejection of the bid.

e. Furnishing of wrong/ambiguous information in the compliance statement may lead to rejection of bid and further black listing of the bidder, if prima-facie it appears that the information in the compliance statement was given with a malafide/fraudulent intent.

5. **Prices**:

a) The Prices quoted should be inclusive of all taxes or duties, packing, forwarding, freight, insurance, delivery and commissioning etc. at destination site (IIT Mandi, Mandi). IIT Mandi is registered with DSIR, Govt. of India and is exempted from Custom / Excise Duty. Exemption Certificate to this effect will be issued by IIT Mandi. **Hence, Customs/Excise Duty exempted price should be quoted**. The rates shall be firm and final. Nothing extra shall be paid on any account. **In the price bid/financial bid, the vendor should clearly mention the final price breakup i.e. ex-work price/FCA price, FOB price, CIP/CIF price & FOR IIT Mandi, Kamand Campus price, as applicable in their bid.**

b) In case of imported equipment(s)/item(s), the agency commission, if any, payable in Indian rupees should be mentioned separately. For imported equipment, the Letter of Credit will be opened for the amount excluding agency commission in Indian Rupees. The firm should clearly mention the address of foreign bank in the financial bid.

6. **Validity**:

The bid should be valid for acceptance up to a period of 180 Days. The Bidders should be ready to extend the validity, if required without any additional financial implications.

7. **Delivery**:

The Equipment should be delivered and installed within the period as specified in the purchase order and be ready for use within 24 weeks of the issue of purchase order unless otherwise prescribed. If the bidder fails to deliver and place any or all the Equipments or perform the service by the specified date, penalty at the rate of 1% per week of the total order value subject to the maximum of 10% of total order value will be deducted.

8. **Training**:

Bidders need to provide adequate training to the nominated persons of IIT Mandi at their cost. IIT Mandi will not bear any training expenditure.

9. **Warranty Declaration**:

Bidders must give the comprehensive onsite warranty as required from the date of successful installation of Equipment against any manufacturing defects and also give the warranty declaration that "*everything to be*

supplied by us hereunder shall be free from all defects and faults in material, workmanship and shall be of the highest quality and material of the type ordered, shall be in full conformity with the specification and shall be complete enough to carry out the experiments, as specified in the tender document.

Any deviation in the material, and the specifications from the accepted terms may liable to be rejected and the bidders need to supply all the goods in the specified form to the satisfaction / specifications specified in the order / contract and demonstrate at the their own cost.

If the cost of equipment is above Rs. 25 lakhs, a performance bank guarantee from a nationalized bank for an amount equal to 10 % of the price for a duration of two months beyond the expiry of warranty period will be taken from the supplier or Indian agent.

10. **Terms of Payment**: Payment will generally be made only after delivery and satisfactory installation, testing, commissioning etc. **This must be specified in the tender/quotation.**

- In case of imported supplies, payment (excluding Indian agency commission, if any) will be made through irrecoverable Letter of Credit in two installments. 80 % of the money will be released on submission of shipping of documents. Remaining 20 % will be released after successful installation of the instrument and submission of a performance bank guarantee for 10% of the order value from a nationalized bank, valid for 2 months beyond the expiry of the warranty.

11. **Tender expenses and documents**: All costs incurred by the bidder in the preparation of the tender shall be at the entire expense of the bidder.

12. **Tender Evaluation Criteria**: The technical bids will be opened and evaluated by a duly constituted committee. After evaluation of the technical bid, the financial bid for only those offers which have qualified in the evaluation of technical bid will be opened.

13. **Return of EMD**:

- The earnest money of unsuccessful bidders will be returned to them without any interest within fifteen working days after awarding the contract.

- The earnest money of the successful bidder will be returned to them without any interest after completing the successful contract

11. **Manual and documentation**: All the manuals necessary for operating and servicing the equipment (including details of electronic circuits) will have to be provided along with the instrument.

12. Bidders should go through the tender terms, conditions and specifications carefully and fill in the attached compliance statement accurately and unambiguously. They should ensure that all the required documents are furnished along with the bid.

Sd/-
Assistant Registrar
Stores & Purchase

BID PARTICULARS

1. Name of the Supplier :

2. Address of the Supplier :

3. Availability of demonstration of equipment : Yes / No

4. Tender cost enclosed: : Yes/No if yes

D.D. No._____ Bank_____ Amount_____

5. EMD enclosed : Yes / No if Yes

D.D. No._____ Bank_____

6. Name and address of the Officer/contact person to whom all references shall be made regarding this tender enquiry.

Name :

Address :

Telephone No. :

Fax No. :

Mobile No :

e-Mail :

Web

Annexure-1

Ref:-ENQUIRYNO:- **IITMANDI/Admin/PUR-135/2013-14/ Liquid Nitrogen Plant (LN2 plant)**

The Indian Institute of Technology Mandi requires a **fully automated** and a **complete system** capable of producing ~**20 liters/hr** of Liquid Nitrogen at 1 atmospheric pressure, inclusive of all the required accessories, equipments and safety devices. The required liquefaction plant must have the following specifications:

Technical Specifications: Liquid Nitrogen Plant (LN2 plant)

1) Expected liquid nitrogen production at atmospheric pressure **~20 liters per hour,**
2) Required purity of liquid nitrogen at atmospheric pressure ***99% or better,***
3) **Power consumption**

   Offer should mention power requirements of the *main equipment* and all *other accessories* in parts.

4) **Liquid Nitrogen vessel:**

   a) Liquid nitrogen storage vessel of capacity: **1000 liters**
   b) Storage Vessel working Pressure: **0-5 bar (g)**
   c) The above liquid nitrogen vessel should have liquid level and pressure indicator and more than one port for connecting vacuum jacketed delivery/transfer lines.
   d) The storage vessel should also be fitted with all standard safety and required accessories.

5) Installation piping kit (preferably stainless steel)
6) Major maintenance kit or spares required for *5 years of plant* operation along with detailed *part list and numbers*.
7) Two sets of complete *user and service manual* in English language (*Hard copy/Soft copy*).
8) Tools set for plant servicing and repairs.
9) The manual for the PLC (Programmable Logic Control) and all other individual components used must be included in the manual. The PLC program must also be provided to monitor/maintain the system.
10) Liquid nitrogen handling package for personal protection such as cryogenic gloves, goggle, flexible cryogen transfer siphon with handle, etc.
11) Must specify if any other equipment (like chiller/stabilizer) is required.
12) **Plant operation and Control**

   a) The plant should be capable of running fully automatic, unattended full-proof and fail-safe operation and be equipped with adequate number of alarms and safety devices.
   b) The pant must be capable of running *continuously for at least 1000 hours without servicing/maintenance*

c) System diagnostics should be integrated with visual display unit.

d) A remote log on facility to monitor and control the plant (Mention about the PLC used)

e) Auto-restart after any period of power resumption with start-up time to full production within 10 minutes. Start-up should be with a single switch operation.

f) The plant must be operable on the electrical supply parameters available at the Institute in Kamand, Mandi. The offer must certify that all machinery, equipment, instruments and controls will keep working and will remain safe at these parameters of electrical supply.

g) The plant will be located at the Indian Institute Technology Mandi, Village Kamand, District-Mandi, HP (India-175005) which is in the hilly area of Himalayan region and hence exposed to cold (up to ~0^0 Celsius or so), humid (up to 80-90% RH during rainy season). The offer must certify that the supplied plant protection will safely withstand these conditions. Please mention the protection class of the offered plant and equipments.

13) P**erformance training:**

The offer must include onsite installation and commissioning of the liquefier and all its components along with onsite training of the operators. Final performance test will be conducted after commissioning at the Institute premises.

NOTE:

A. The offer must confirm that the plant operating procedure will allow transfer of liquid nitrogen from the storage vessel into vacuum insulated transfer tube or to the external tanker without adversely affecting the liquefaction process in any mode of operation.

B. The offer must give performance data on guaranteed liquefying rates in various operating pressure and corresponding liquid nitrogen purity.

C. An integral purifier should remove water traces if any.

D. The offer must furnish preventive maintenance schedules for the plant and its components.

E. The offer must contain a list of all the spare parts required for smooth operation of the plant.

F. Vendor should submit a list of the institutes in India where similar plants are supplied.

G. The offer must mention the electric power requirements and room requirement.

H. The tender must be quoted with five years on-site comprehensive Warranty / Guarantee commencing from the date of complete and satisfactory installation of the equipment against the defect of any manufacturing, workmanship and poor quality of the components.

Compliance statement for technical specifications for LN2 plant

Sl. No.	**Required indent specifications**	**Our Requirement**	***Pl mention your remarks in YES or NO format or mention the values***
A	Required liquid nitrogen production capacity at a pressure of *1 bar(g)*	***~20 liters per hour***	
B	Expected liquid nitrogen production at atmospheric pressure	**~20 liters per hour**	
C	**Power consumption** Offer should mention both the *connected power and actual power consumption* of the following equipments. • Air compressor (Mention whether air or water cooled) • Liquefier • Chiller unit if any • Control power • Other accessories		
D	**Scope of Supply:**		
1	One modular (water/air cooled), oil lubricated rotary screw compressor with integral electrical starter & motor protection		
2	Air blast cooler or chiller unit		
3	Buffer tank or air receiver		
4	Pressure swing adsorber system		
5	Cold box with integral turbine and turbine cooling system **OR** Cryogenerator		
6	*Liquid Nitrogen vessel:*		
a.	Liquid nitrogen vessel, horizontal type capacity: 1000 liters		
b.	Storage Vessel working Pressure: ***0-5 bar (g).***		
c.	The above liquid nitrogen vessel should have more than one accessible ports for connecting vacuum jacketed/ other delivery transfer lines.		
d.	In addition to the above, the storage vessel should be fitted with standard accessories such as, decanting port with flow capacity liquid outlet valve, adjustable liquid pressure maintaining system, liquid level controller with adjustable high & low set points switches, liquid level indicator, pressure indicator, safety valves, adjustable liquid		

	pressure maintaining system, liquid level controller with adjustable high & low set points switches,	
7	Installation piping kit	
8	Major maintenance kit or spares required for *5 years of plant* operation.	
9	Two sets of complete user / service manual in English language.(Hard copy and softcopy)	
10	Tools set for plant servicing and repairs	
11	Liquid nitrogen handling package for personal protection such as cryogenic gloves, goggle, flexible cryogen transfer siphon with handle, etc.	
E	**Plant operation and Control**	
1	The plant should be capable of unattended, fully automatic, fool-proof and fail-safe operation and be equipped with adequate number of Annunciators, Alarms and Safety devices	
2	The plant operation and control should be fully automatic using PLC Control	
3	System Diagnostics: Should be system integrated with visual display unit.	
3	Auto-restart after any period of power resumption with start-up time to full production within 10 minutes. Start up is to be with a single switch operation	
4	The plant must be operable on the electrical supply parameters available at the Institute as:- 415 VAC plus or minus 10%, 3-phase, 50 Hz. The offer must certify that all the machinery, equipment, instruments and controls will keep working and will remain safe at these parameters of electrical supply. In case the electrical supply parameters change beyond the above range the system may shut-down but all its components will remain safe from any damage.	
5	The plant will be located at the Indian Institute Technology Mandi, in Kamand, District-Mandi, HP (India) which is in the hilly area of Himalayan region and hence exposed to cold (up to ~0^{0} Celsius or so), humid (up to 80-90% RH during rainy season). The offer must certify that the supplied plant protection will safely withstand these conditions. Please mention the protection class of the offered plant and equipments.	
F	**Plant inspection and performance training:**	
1	The offer must include the onsite training of institute's engineers/operator	

2	The offer must include onsite installation and commissioning of the liquefier and all its components	
3	Final performance test will be conducted after commissioning in Institute premises.	
G	**Essential requirements for the evaluation of the tender**	
1	*NOTE:* *The basic criteria for selecting the plant will be on the basis of the cost analysis made on capital & running cost (i.e. the power efficiency, manpower requirement and maintenance for an estimated period of 10 years)*	
2	The offer must confirm that the plant operating procedure will allow transfer of liquid nitrogen from the storage vessel into vacuum insulated pipings or to the external tanker without adversely affecting the liquefaction process in any mode of operation.	
3	The offer must give performance data on guaranteed liquefying rates in various operating pressure (i.e., atm pressure, 1barg, 2barg) and corresponding liquid nitrogen purity.	
4	Defrosting / Purging: No Defrosting / Purging should be necessary. An integral purifier should remove water traces if any.	
5	Minimum maintenance interval of the plant shall not be less than 4000 hours of operation	
6	The offer must furnish preventive maintenance schedules for the plant and its components inclusive of mechanical, electrical and electronic systems.	
7	The offer must contain a list of mechanical / electrical / electronic spare parts for all the plant components like cold box/cryogenerator, compressor, PSA system, control system etc.	
8	Assembly & Testing : Should be factory assembled and rigorously tested	
9	The offer must contain full details of the plant components viz. make, model, type, of compressor details of oil removal system, PSA system, purifier module, coldbox or cryogenerator.	
10	Vendor should submit the details of similar plants supplied in India. Contact details of all such customers to be provided as reference.	
11	The offer must mention the electric power requirements (cable size, ratings etc), air and water requirement, floor preparation if needed, requirement of duct if any and other utilities required	
12	The offer must contain shipment packing size, weight and volume of	

	each consignment	
13	The offer must confirm that the warranty will start from the date of satisfactory commissioning in the Institute	
H	**Other Requirements:**	
1	Delivery schedule	
2	Time required for the plant installation & commissioning at site.	
3	Payment terms and conditions	
4	Warranty terms and conditions	
5	Validity of the offer should be 120 days from the date of opening of the tender	

Compliance statement for tender terms and conditions and technical specifications for Liquid Nitrogen Plant

INDIAN INSTITUTE OF TECHNOLOGY MANDI
HIMACHAL PRADESH-175001

Ref:-ENQUIRY NO:- **IITMANDI/Admin/PUR135/2013-14/ Liquid Nitrogen Plant (LN2 plant)**

Instructions: 1. You have to fill in all columns and ensure that you furnish all the required information accurately and unambiguously.

2. If our specification contains any values, you have to provide your values against the column in the same unit as we have specified.
3. Deviation in values, materials etc. from our specification may be explained in the remarks column

S. NO	Check list of documents/ Undertakings	YES/ NO	Remarks (Give explanation if answer is No)
1	Is Tender fees attached?		
2	Is EMD attached?		
3	Is the bidder original equipment manufacturer (OEM)/authorised dealer?		
4	If authorised dealer, recent dated certificate to this effect from OEM, attached or not?		
5	Undertaking from OEM regarding technical support & extended warranty period		
6	Bid Validity of 180 days or not?		
7	Whether separate undertaking from bidder regarding acceptance of all tender terms & conditions enclosed with technical bid?		
8	Whether list of reputed users (along with telephone numbers of contact persons) for the past three years specific to the instrument attached.		
9	Whether special educational discount for Indian Institute of Technology (IIT) Mandi (H.P) given.		
10	Whether two weeks training of operator and research students without any charges offered.		
11	**Fill the attached compliance sheet with remarks and provide explanations thereto if the equipment and accessories vary from the specifications.**		
12	Whether free Installation, Commissioning and Application Training offered.		
13	Whether comprehensive onsite extended warranty offered for all the instruments. Mention Warranty Period for each instrument in the technical compliance sheet.		
14	Whether Annual maintenance after expiry of comprehensive onsite warranty quoted separately as optional.		